



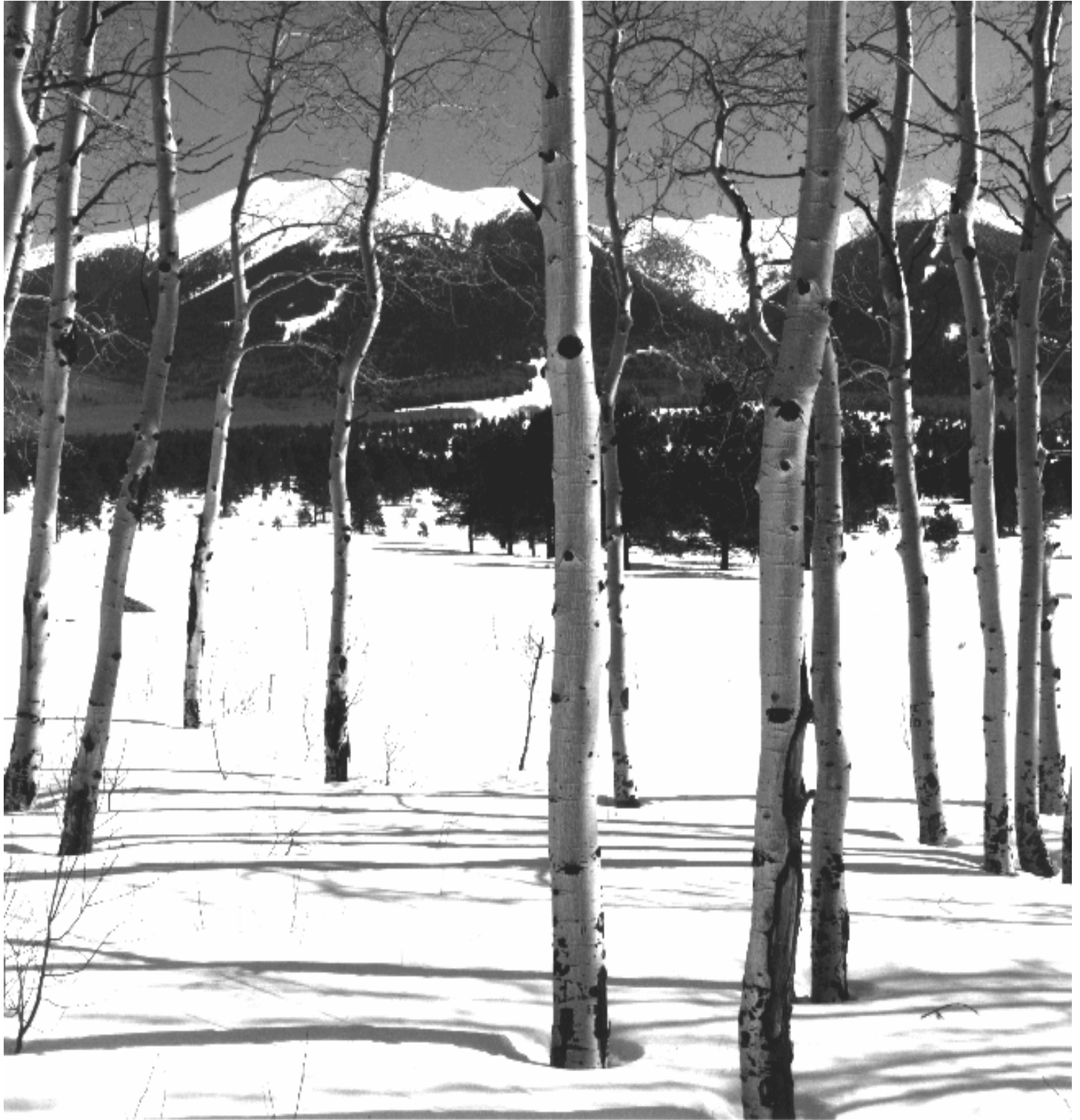
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

Arizona

Basin Outlook Report

April 1, 2004



Basin Outlook Reports and Federal - State - Private Cooperative Snow Surveys

For more water supply and resource management information, contact:

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation and streamflow values are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Issued by

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ARIZONA

Water Supply Outlook Report

as of April 1, 2004

A full range of Snow Survey and Water Supply Forecasting products is available on the Arizona NRCS Home Page:

Arizona Snow Survey Program

<http://www.az.nrcs.usda.gov/snow/index.html>

Helpful Internet Sites

Defending Against Drought – NRCS

<http://www.nrcs.usda.gov/feature/highlights/drought.html>

- Ideas on water, land, and crop management for you to consider while creating your drought plan.

Arizona Agri-Weekly

<http://www.nass.usda.gov/az/cur-agwk.pdf>

- Provides an overview of Arizona's crop, livestock, range and pasture conditions as reported by local staffs of the USDA's Agricultural Statistic Service and the University of Arizona.

SUMMARY

Final snow measurements show that Arizona's mountain snowpacks are nearing melt out for the season. This condition is as much as a month ahead of time. Additionally, runoff forecasts call for well below normal flows and water users should expect reduced water supplies through the spring and summer water-use season.

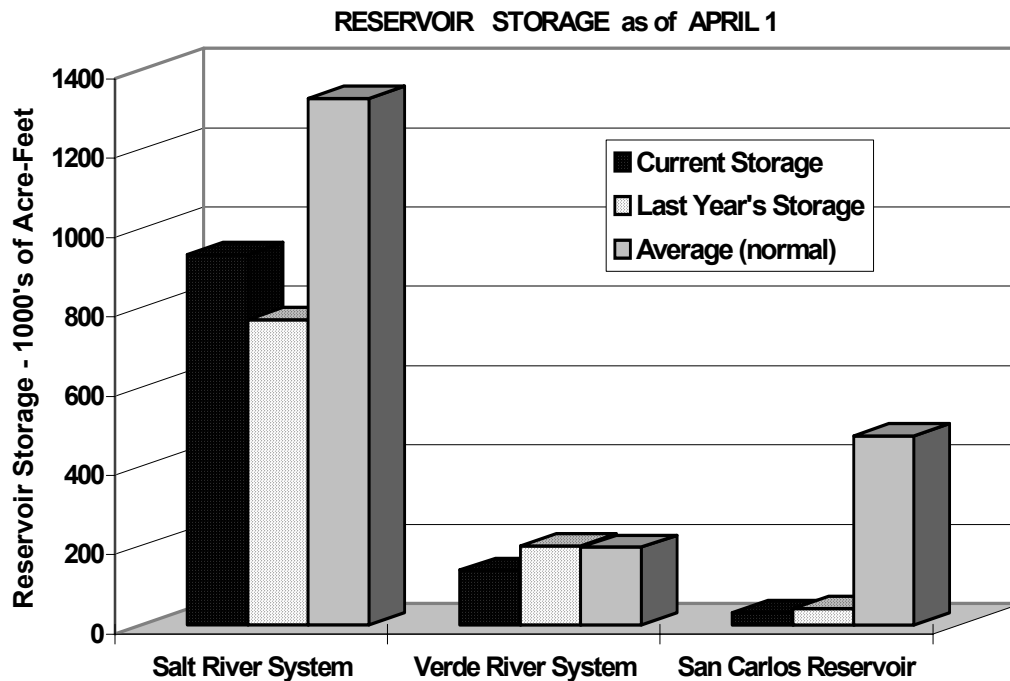
SNOWPACK

Watershed	Percent (%) of 30-Yr. Average Snowpack Levels as of April 1
Salt River Basin	13%
Verde River Basin	15%
Little Colorado River Basin	7%
San Francisco-Upper Gila River Basin	35%
Other Points of Interest	
Chuska Mountains	8%
Central Mogollon Rim	2%
Grand Canyon	0%
San Francisco Peaks	41%
Statewide Snowpack	22%

PRECIPITATION

SNOTEL data show that precipitation amounts for March were well below average for the Salt, Verde, and Little Colorado River Basins, while stations in the San Francisco-Upper Gila River Basin reported well above average precipitation for the month. Stations in Northwest Arizona reported extremely low precipitation amounts for March. Please refer to the basin bar graphs found in this report for more information regarding precipitation amounts.

RESERVOIR

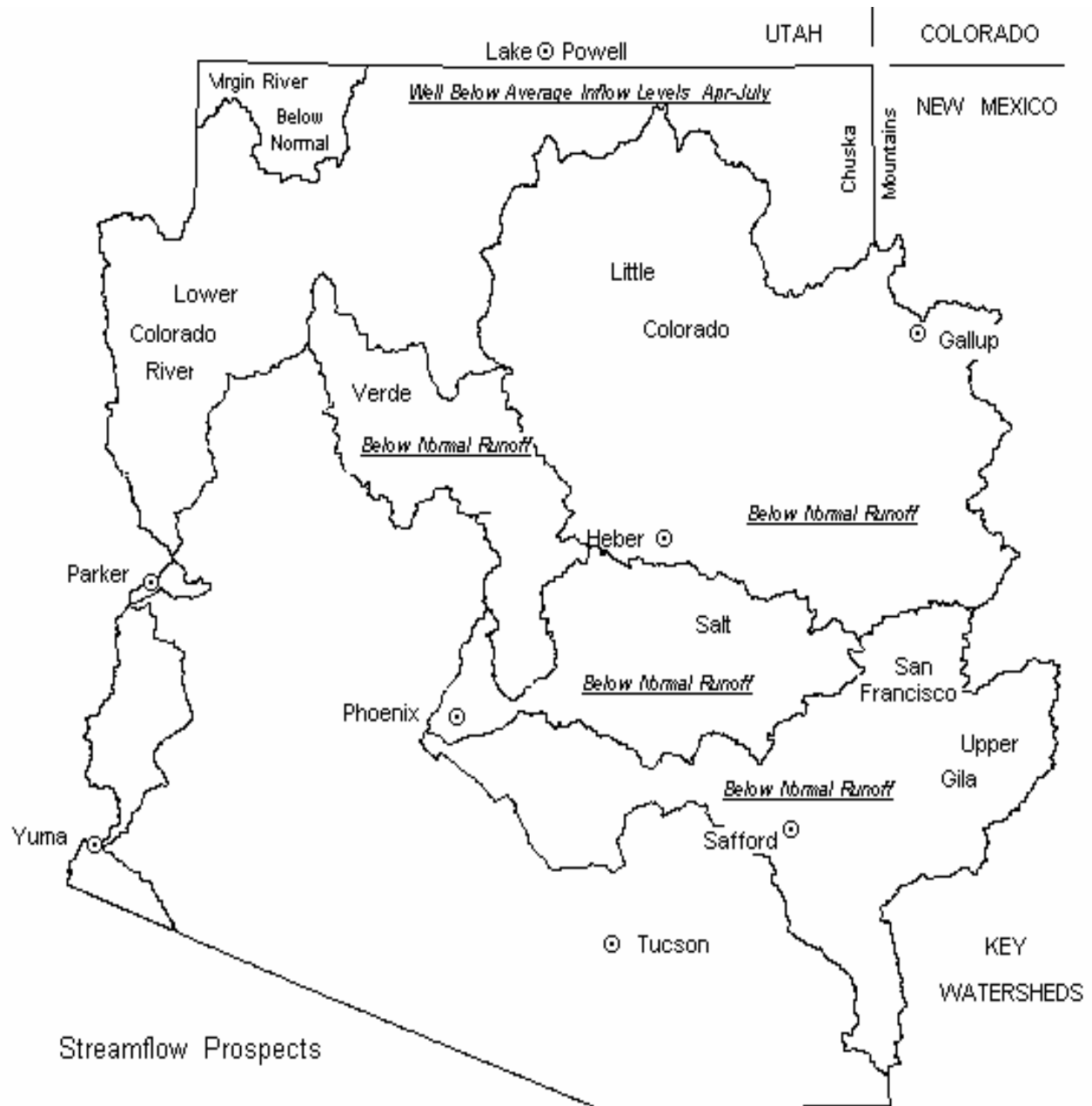


Key storage volumes displayed in thousands of acre-feet (1000 x):

RESERVOIR	CURRENT STORAGE	LAST YEAR STORAGE	30-YEAR AVERAGE
Lyman Lake	4.2	2.7	17.2
Show Low Lake	3.5	4.6	4.1
Lake Pleasant	698.4	663.4	----
Lake Havasu	536.2	540.8	562.3
Lake Mohave	1677.2	1685.9	1680.4
Lake Mead	15255.0	16826.0	21999.0
Lake Powell	10180.0	12444.0	18326.0
Salt River System	932.8	769.4	1327.4
Verde River System	137.8	198.5	195.7
San Carlos Reservoir	30.1	41.7	476.9

STREAMFLOW

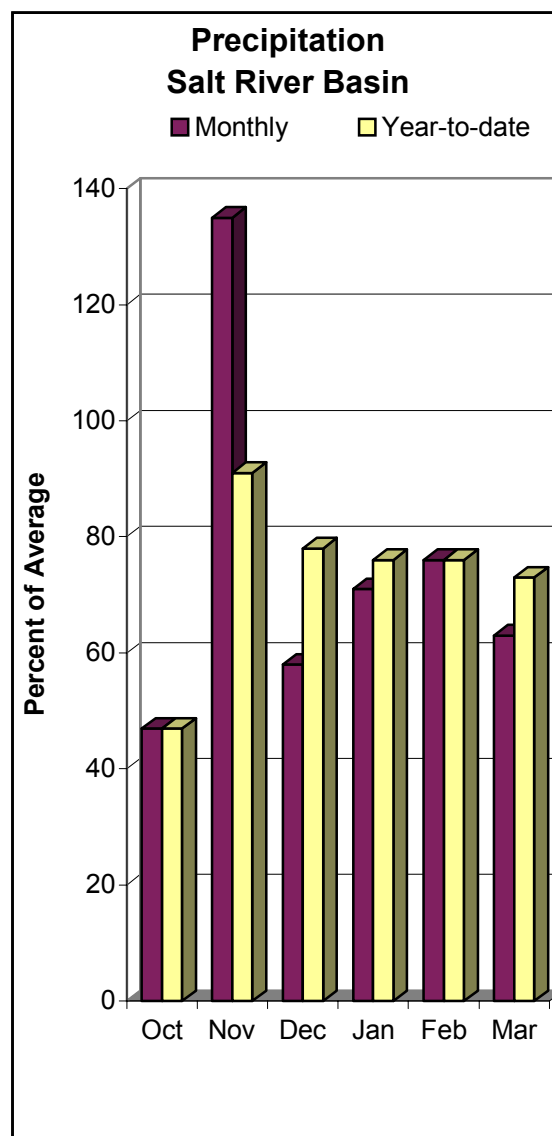
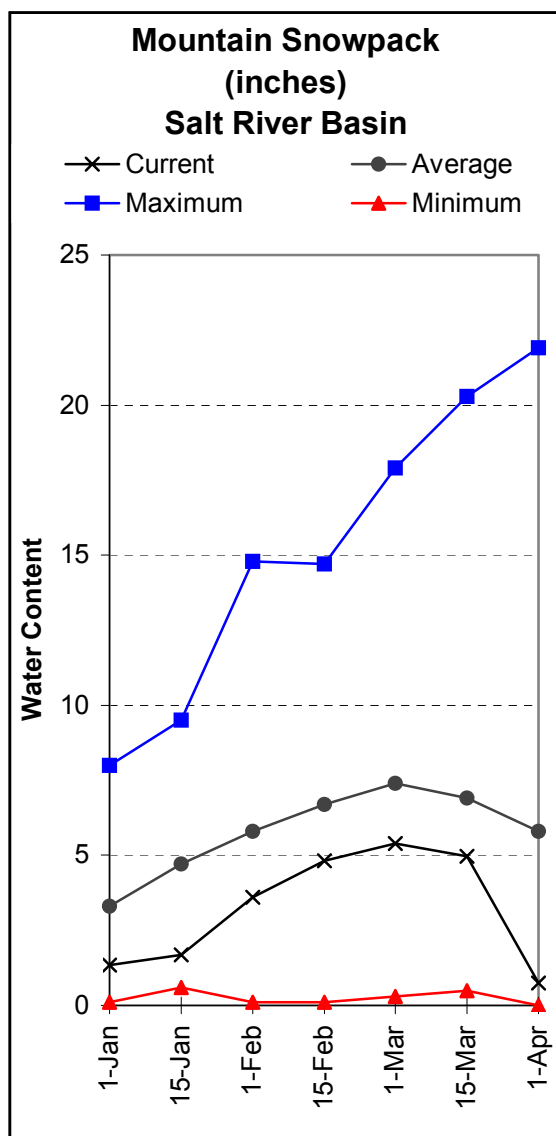
Well below median streamflow levels are forecast for all major rivers and streams in Arizona. Please refer to the basin forecast tables found in this report for more information regarding seasonal water supplies.



SALT RIVER BASIN as of April 1, 2004

Well below median streamflow levels are forecast for the basin. For the Salt River, near Roosevelt, the forecast calls for 35 % of median streamflow levels through May, while at Tonto Creek, the forecast calls for 24 % of median streamflow levels through May.

Additionally, snow survey measurements show basin snowpack levels to be 13 % of the 30-year average, while combined reservoir storage in the Salt River system stands 932,834 acre-feet.



SALT RIVER BASIN
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Med
Period	(1000AF)	(1000AF)	(1000AF) (% MED.)	(1000AF)	(1000AF)		(1000AF)
Salt River nr Roosevelt							
APR-MAY	28	40	50	35	61	81	143
APRIL	9.2	22	35	38	48	67	92
Tonto Creek ab Gun Creek nr Roosevelt							
APR-MAY	0.51	1.24	2.00	24	3.02	5.09	8.40
APRIL	0.30	0.61	1.50	25	2.60	4.30	6.10

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average and median are computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

SALT RIVER BASIN
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
SALT RIVER RES SYSTEM	2025.8	932.8	769.4	1327.4

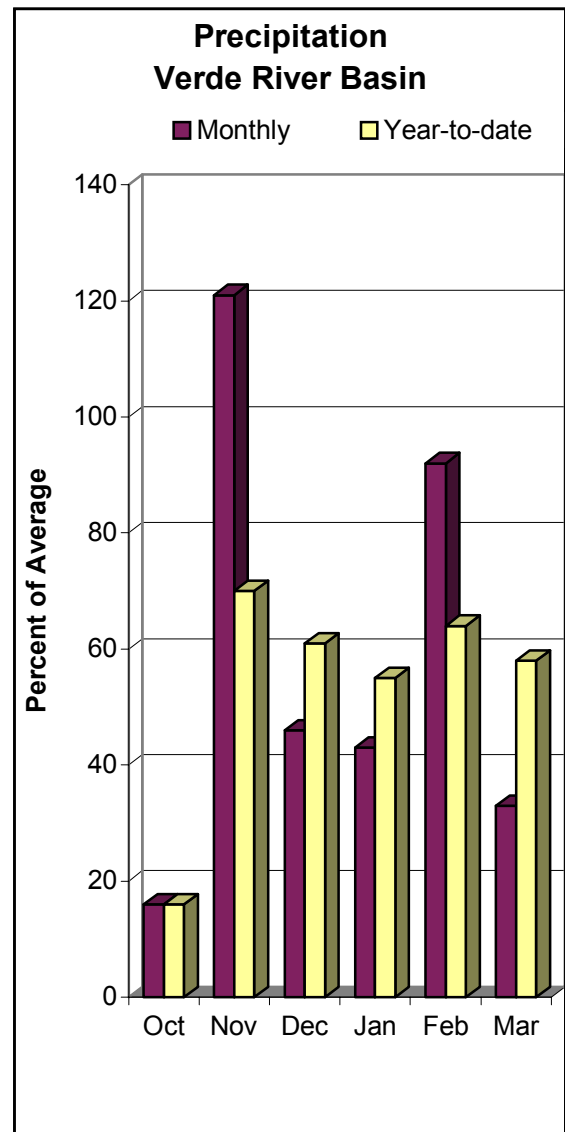
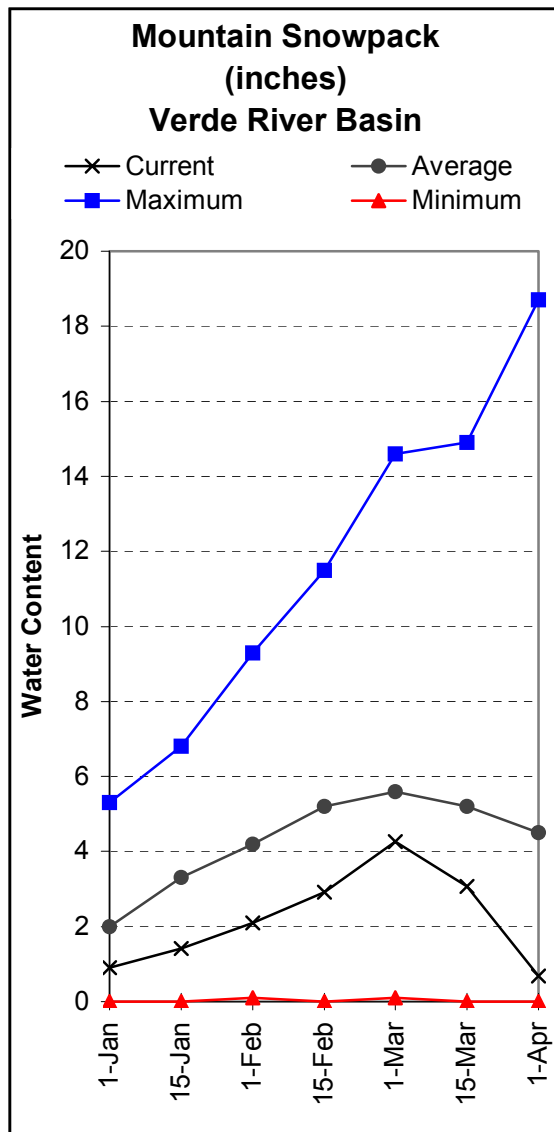
SALT RIVER BASIN
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SALT RIVER BASIN	8	18	13

VERDE RIVER BASIN as of April 1, 2004

Well below median streamflow levels are forecast for the basin. For the Verde River, at Horseshoe Dam, the forecast calls for 15 % of median streamflow levels through May.

Furthermore, snow survey measurements show basin snowpack levels to be 15 % of the 30-year average, while combined reservoir storage stands at 137,759 acre-feet.



VERDE RIVER BASIN
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Med
Period	(1000AF)	(1000AF)	(1000AF) (% MED.)	(1000AF)	(1000AF)		(1000AF)
Verde River abv Horseshoe Dam							
APR-MAY	10.0	15.4	20	46	25	35	44
APRIL	3.4	8.5	12.0	35	17.5	26	34

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average and median are computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

VERDE RIVER BASIN
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** This Year	***** Usable Storage Last Year	***** Average
VERDE RIVER RES SYSTEM	287.4	137.8	198.5	195.7

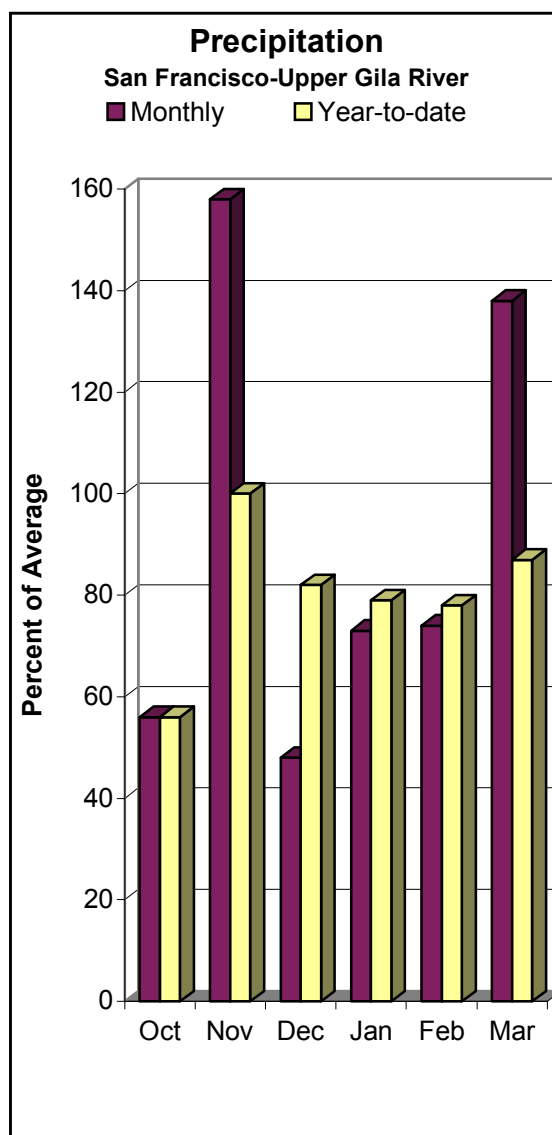
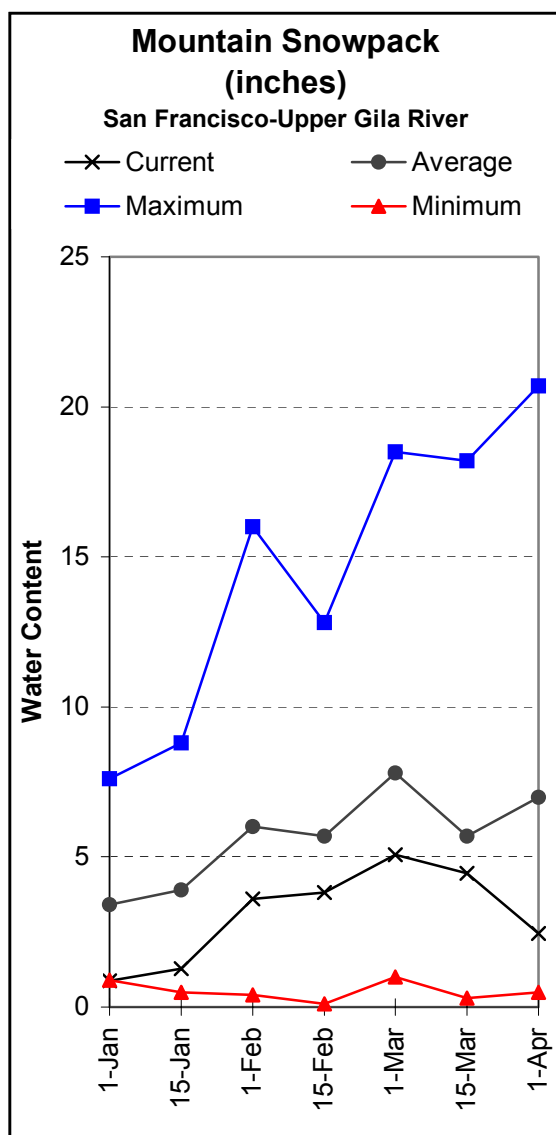
VERDE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
VERDE RIVER BASIN	10	43	15
SAN FRANCISCO PEAKS	4	50	41

SAN FRANCISCO-UPPER GILA RIVER BASIN as of April 1, 2004

Well below median streamflow levels are forecast for the basin. For the San Francisco River, at Clifton, the forecast calls for 60 % of median streamflow levels through May, while in the Gila River, near Solomon, the forecast calls for 52 % of median streamflow levels through May. At San Carlos Reservoir, inflow into the lake is forecast at 91 % of median through May.

At San Carlos, reservoir storage remains low at 30,051 acre-feet, while snow survey measurements show basin snowpack levels to be 35 % of the 30-year average.



SAN FRANCISCO - UPPER GILA RIVER BASIN
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Med
Period	(1000AF)	(1000AF)	(1000AF) (% MED.)	(1000AF)	(1000AF)		(1000AF)
Gila River at Gila							
APR-MAY	6.6	9.3	11.5	67	14.0	18.4	17.3
Gila River nr Virden							
APR-MAY	2.4	6.0	11.5	48	22	32	24
San Francisco River at Glenwood							
APR-MAY	2.03	3.58	5.00	64	6.75	9.99	7.80
San Francisco River at Clifton							
APR-MAY	1.9	5.3	11.0	60	16.7	25	18.5
Gila River nr Solomon							
APR-MAY	4.2	10.5	22	52	37	62	42
APRIL			16.0	55			29
San Carlos Reservoir inflow							
APR-MAY	1.5	6.0	14.0	91	22	34	15.4

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average and median are computed for the 1971-2000 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.

SAN FRANCISCO - UPPER GILA RIVER BASIN
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
SAN CARLOS	875.0	30.1	41.7	476.9
PAINTED ROCK DAM	2492.0	0.0	0.0	318.5

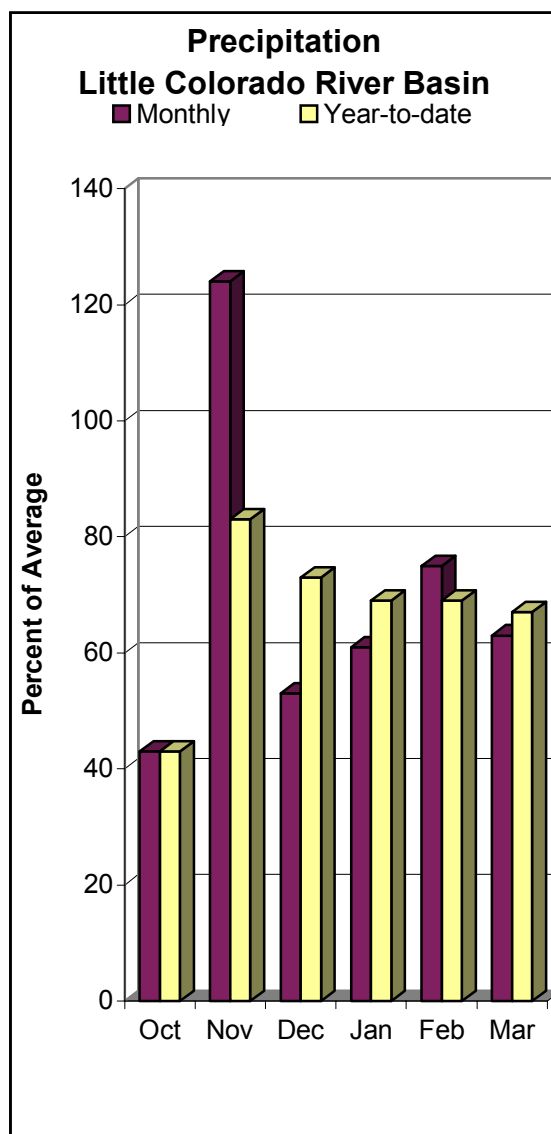
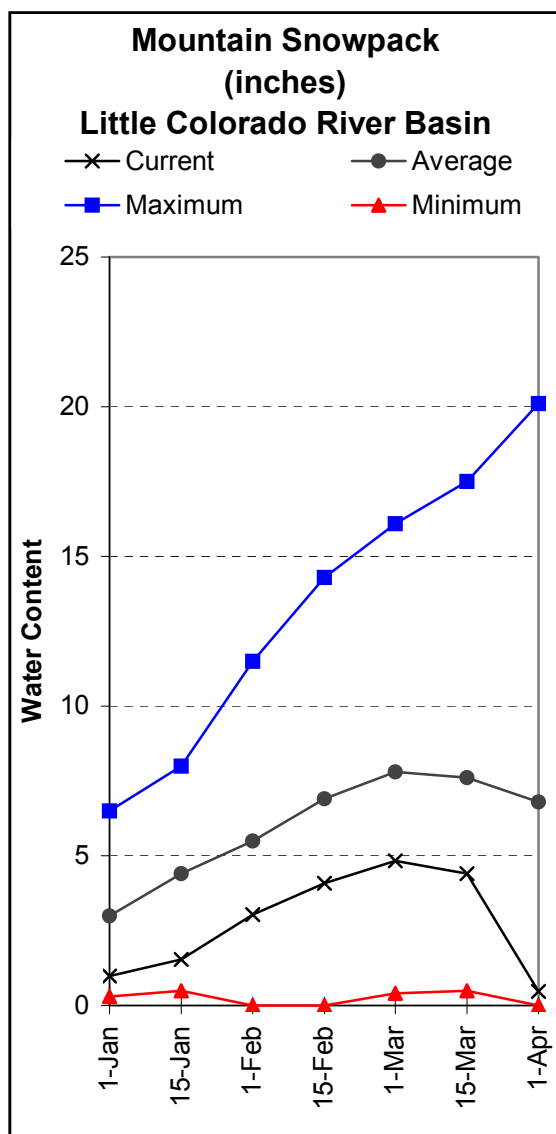
SAN FRANCISCO - UPPER GILA RIVER BASIN
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SAN FRANCISCO - UPPER GILA R	11	39	35

LITTLE COLORADO RIVER BASIN as of April 1, 2004

Well below median streamflow levels are forecast for the basin. For the Little Colorado River, at Lyman Lake, the forecast calls for 35 % of median streamflow levels through June, while at Woodruff, the forecast calls for 36 % of median streamflow levels through May.

Additionally, snowpack levels at the southern headwaters of the Little Colorado River and along the central Mogollon Rim were measured at 7 % and 2 % of the 30-year average, respectively.



LITTLE COLORADO RIVER BASIN
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Med
Period	(1000AF)	(1000AF)	(1000AF) (% MED.)	(1000AF)	(1000AF)		(1000AF)
Little Colorado River abv Lyman Lake							
APR-JUN	0.56	0.91	1.50	35	2.30	3.93	4.30
Rio Nutria nr Ramah							
APR-MAY	0.05	0.09	0.20	39	0.37	0.75	0.52
Ramah Reservoir inflow							
APR-MAY	0.03	0.07	0.11	38	0.20	0.29	0.29
Zuni River abv Black Rock Reservoir							
APR-MAY	0.06	0.16	0.25	39	0.45	0.64	0.64
Little Colorado River at Woodruff							
APR-MAY	0.08	0.21	0.30	36	0.59	0.84	0.84
Blue Ridge Reservoir inflow							
APR-MAY	0.74	1.03	1.60	33	2.29	3.54	4.90
Lake Mary inflow							
APR-MAY	0.15	0.29	0.50	34	0.79	1.41	1.46

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average and median are computed for the 1971-2000 base period.

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LITTLE COLORADO RIVER BASIN
Reservoir Storage (1000AF) End of March

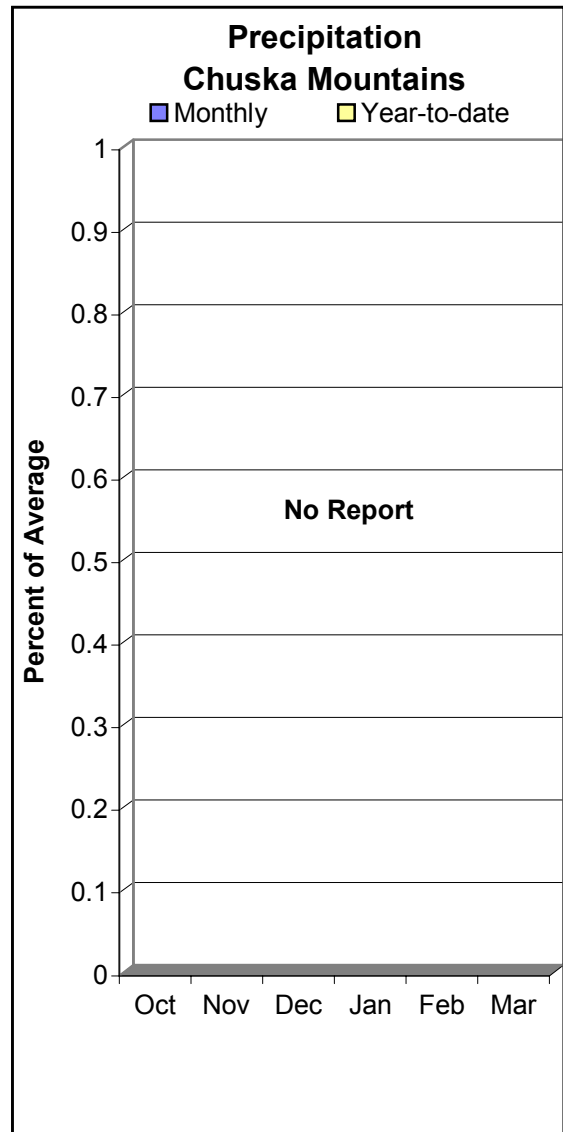
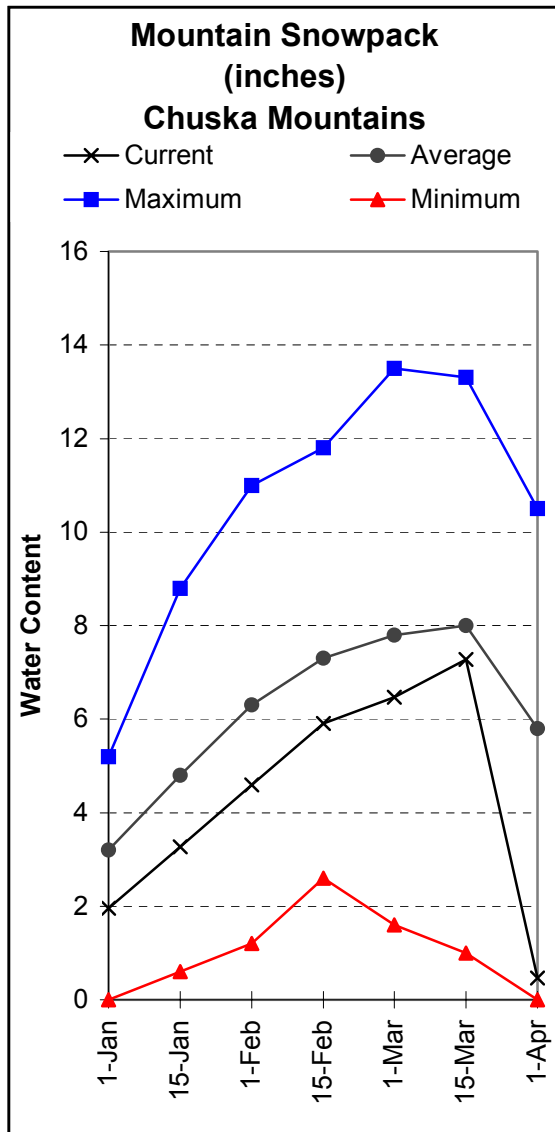
Reservoir	Usable Capacity	***** This Year	Usable Storage Last Year	***** Average
LYMAN RESERVOIR	30.0	4.2	2.7	17.2
SHOW LOW LAKE	5.1	3.5	4.6	4.1

LITTLE COLORADO RIVER BASIN
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
LITTLE COLORADO - SOUTHERN H	9	8	7
CENTRAL MOGOLLON RIM	4	4	2

CHUSKA MOUNTAINS as of April 1, 2004

Snow measurements conducted by staff from the Navajo Tribe show the Chuska Mountain snowpack to be 8 % of average, while well below average streamflow levels are forecast for Captain Tom Wash, Wheatfields Creek, and Bowl Canyon Creek, through the spring water-use season.



CHUSKA MOUNTAINS
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Avg
Period	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		(1000AF)
Captain Tom Wash nr Two Gray Hills							
MAR-MAY	0.28	0.71	1.20	42	2.70	5.00	2.83
Wheatfields Creek nr Wheatfields							
MAR-MAY	0.29	0.73	1.20	41	2.80	5.10	2.90
Bowl Canyon Creek abv Assayi Lake							
MAR-MAY	0.10	0.20	0.40	40	0.94	1.72	1.00

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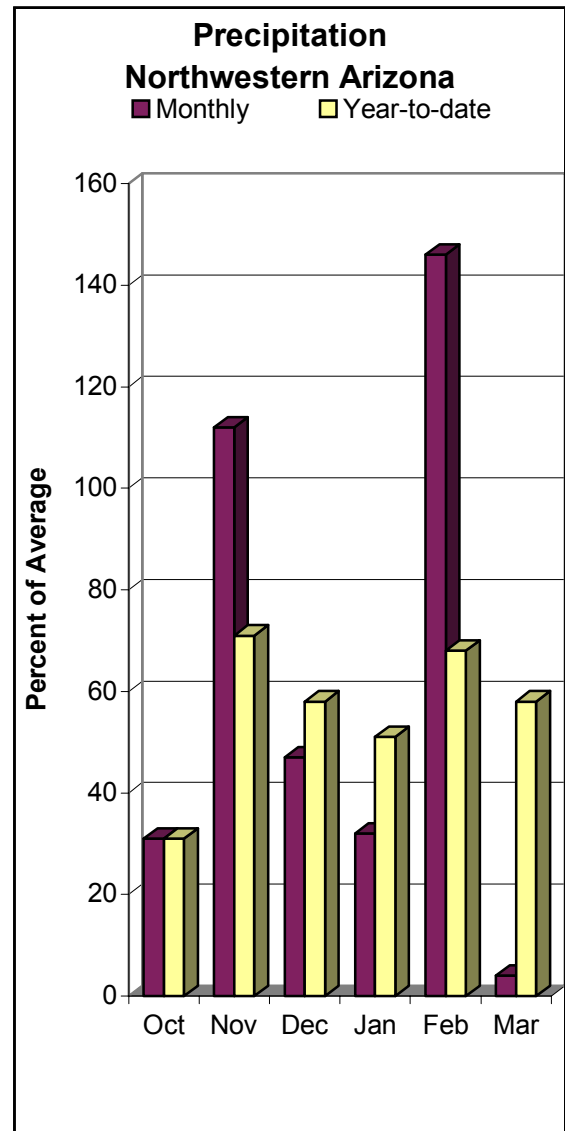
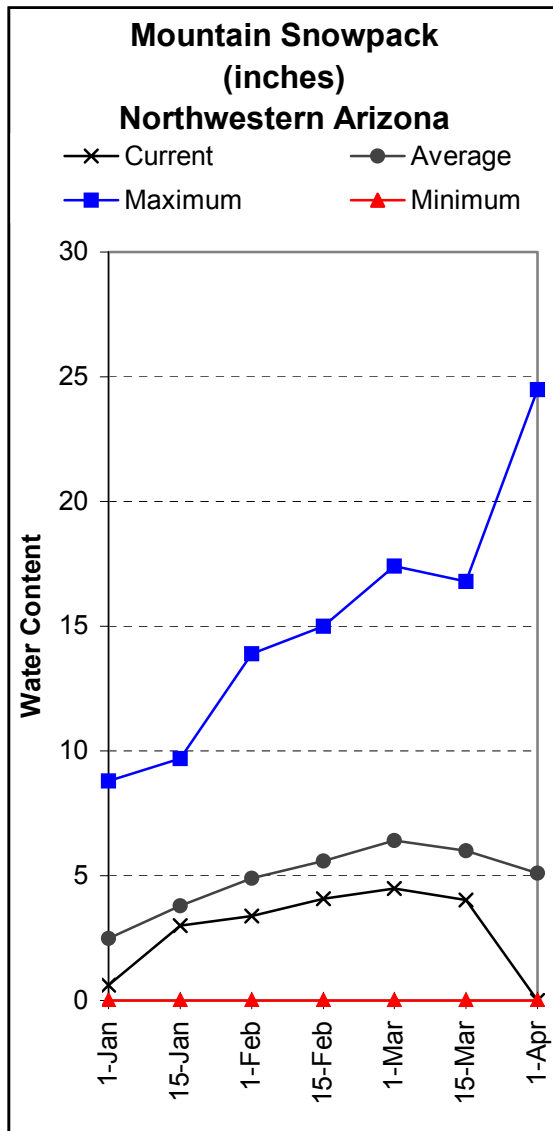
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- (2) - The value is natural volume - actual volume may be affected by upstream water management.

CHUSKA MOUNTAINS
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Percent of Average
CHUSKA MOUNTAINS	7	6	8
DEFIANCE PLATEAU	2	0	0

NORTHWESTERN ARIZONA as of April 1, 2004

At the Colorado River, inflow into Lake Powell is forecast at 50 % of average, April-July, while at the Grand Canyon, snow surveys conducted by staff from the National Park Service show north and south rim snowpacks to have melted out (0 % of average).



NORTHWESTERN ARIZONA
Streamflow Forecasts - April 1, 2004

	<=== Drier === Future Conditions === Wetter ===>						
Forecast Pt	Chance of Exceeding *						
Forecast	90%	70%	50% (Most Prob)	30%	10%		30 Yr Avg
Period	(1000AF)	(1000AF)	(1000AF) (% AVG.)	(1000AF)	(1000AF)		(1000AF)
Virgin River at Littlefield							
APR-JUL	6.3	16.0	23	31	30	40	74
Lake Powell inflow							
APR-JUL	1490	2980	4000	50	5020	6510	7930

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.

NORTHWESTERN ARIZONA
Reservoir Storage (1000AF) End of March

Reservoir	Usable Capacity	***** This Year	***** Usable Storage Last Year	***** Average
LAKE HAVASU	619.0	536.2	540.8	562.3
LAKE MOHAVE	1810.0	1677.2	1685.9	1680.4
LAKE MEAD	26159.0	15255.0	16826.0	21999.0
LAKE POWELL	24322.0	10180.0	12444.0	18326.0

NORTHWESTERN ARIZONA
Watershed Snowpack Analysis - April 1, 2004

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
GRAND CANYON	2	0	0

S N O W S U R V E Y D A T A

APRIL 1, 2004

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
ARBABS FOREST (AK)	7680	4/01	0	0.0	0.0	.3
BAKER BUTTE SNOTEL	7330	4/01	-	0.0	0.0	4.5
BAKER BUTTE #2	7700	3/30	2	0.8	8.8	13.9
BALDY SNOTEL	9220	4/01	-	0.0	7.4	6.9
BEAR PAW	10100	3/31	25	10.4	13.3	21.2
BEAVER HEAD	8000	3/31	0	0.0	0.0	1.3
BEAVER HEAD SNOTEL	7990	4/01	-	0.0	0.0	1.5
BEAVER SPRING	9220	3/31	0	0.0	9.6	8.1
BRIGHT ANGEL	8400	3/31	0	0.0	4.7	9.9
BUCK SPRING	7400	3/31	0	0.0	0.0	.7
CHALENDER	7100	3/31	0	0.0	0.0	1.6
CHEESE SPRINGS	8600	3/30	0	0.0	6.9	3.8
CORONADO TRL SNOTEL	8400	4/01	-	0.3	0.0	.7
CORONADO TRAIL	8350	3/31	0	0.0	0.0	1.2
FLUTED ROCK	7800	4/01	0	0.0	1.3	.6
FORT APACHE	9160	3/30	8	2.6	8.2	7.2
FORT VALLEY	7350	3/30	0	0.0	0.0	1.0
FRY SNOTEL	7220	4/01	-	0.1	0.0	3.2
GRAND CANYON	7500	3/31	0	0.0	0.0	.8
HANNAGAN MDWS SNOTEL	9020	4/01	-	1.1	9.4	10.8
HAPPY JACK	7630	3/29	0	0.0	0.0	3.0
HAPPY JACK SNOTEL	7630	4/01	-	0.0	0.6	2.8
HEBER SNOTEL	7640	4/01	-	0.0	0.0	2.9
LAKE MARY	6930	3/30	0	0.0	0.0	.5
MAVERICK FORK SNOTEL	9200	4/01	-	0.6	7.4	9.0
MORMON MTN SNOTEL	7500	4/01	-	1.9	0.1	5.0
MORMON MT. SUMMIT #2	8470	3/30	13	5.0	9.7	15.1
NEWMAN PARK	6750	3/30	0	0.0	0.0	1.0
NUTRIOSO	8500	3/31	0	0.0	0.0	.7
PROMONTORY SNOTEL	7900	4/01	-	0.0	9.3	11.4
SNOW BOWL #1 ALT.	10260	3/29	10	3.0	10.2	14.1
SNOW BOWL #2	11000	3/29	23	6.8	17.8	22.5
SNOWSLIDE CANYON	9750	3/31	16	7.0	12.8	15.9
SNOWSLIDE CYN SNOTEL	9750	4/01	-	9.3	17.7	14.4
TSAILE CANYON #1	8160	3/30	0	0.0	7.0	3.4
TSAILE CANYON #3	8920	3/30	0	0.0	12.2	7.0
WHITE HORSE SNOTEL	7180	4/01	-	0.0	1.3	3.0
WILDCAT SNOTEL	7850	4/01	-	0.0	0.0	2.0
WILLIAMS SKI RUN	7720	4/02	0	0.0	4.7	9.5
WORKMAN CREEK SNOTEL	6900	4/01	-	0.0	0.0	2.7